



SERVIR: From Space to Village



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USAID
FROM THE AMERICAN PEOPLE



ICIMOD



GROUP ON
EARTH OBSERVATIONS

Agenda



- SERVIR Background
 - Vision/Mission
 - Program History
 - NASA Applied Sciences
 - USAID Results Framework
- SERVIR in Action
 - GEOSS Themes
 - Partnerships
 - Latest Developments
- Future Plans
- Questions?



What is SERVIR?



A NASA-USAID partnership to improve environmental management and resilience to climate change by strengthening the capacity of governments and other key stakeholders to integrate earth observation information and geospatial technologies into development decision-making



SERVIR-Himalaya



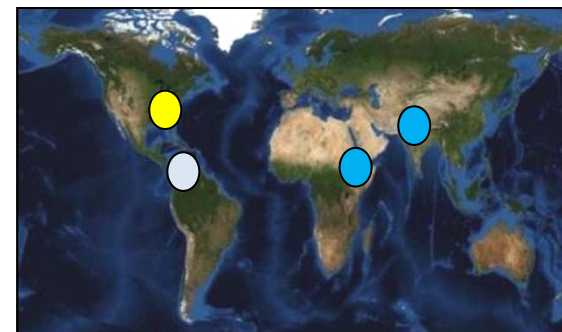
SERVIR-East Africa



NASA-USAID MOU



South-South Collaboration



Current SERVIR Network

NASA Applied Sciences

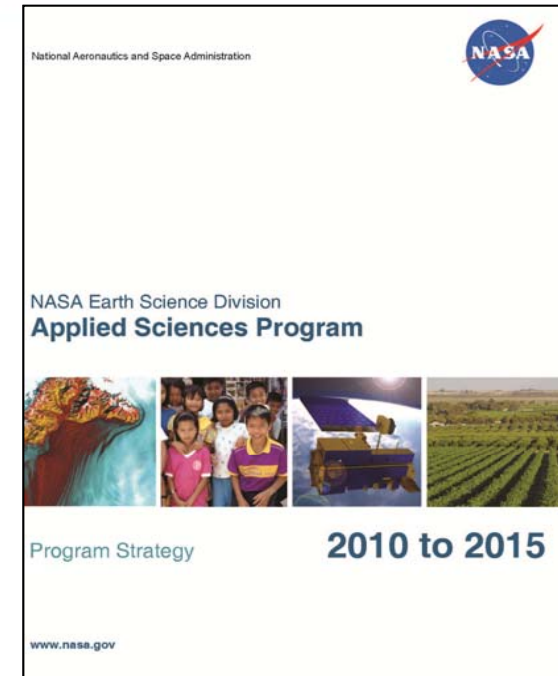


Discovering and demonstrating innovative and practical applications of Earth Science

The Applied Sciences Program funds projects that enable uses of Earth observations and NASA Earth science in organizations' policy, business, and management decisions.

Applications

Hands-on projects and studies to prove-out and demonstrate applications ideas targeted at integrating Earth observations in specific decision-making activities



<http://AppliedSciences.NASA.gov>

Capacity Building

Projects and activities to build skills, users, and capabilities in the US and developing countries on how to access and apply environmental satellite data to benefit society



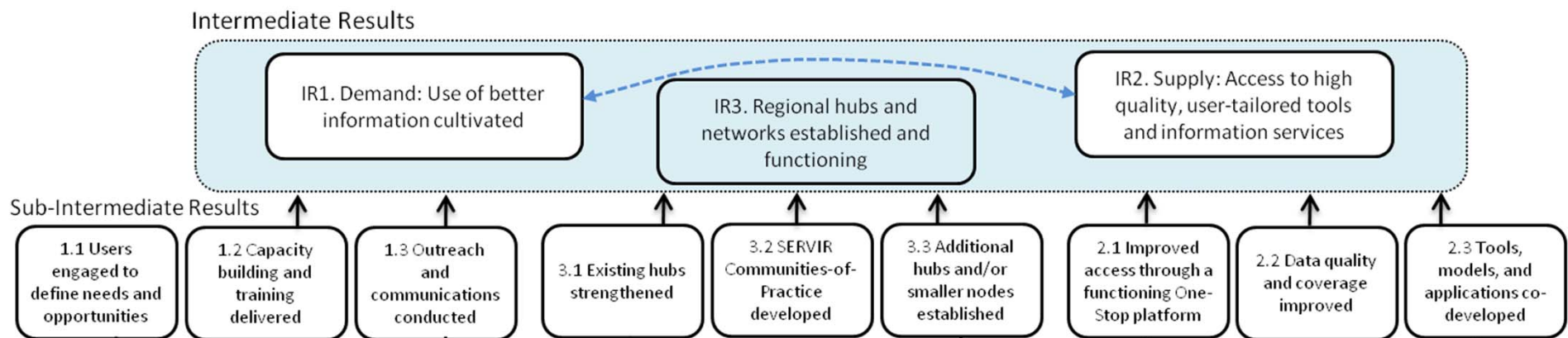
U.S. Agency for International Development



Science and Technology – renewed focus on integrating science, technology, and innovation in the practice of development to solve today's most pressing development challenges around the globe.



SERVIR Results Framework



Roles and responsibilities:

USAID: Cultivate use of better information in host nations

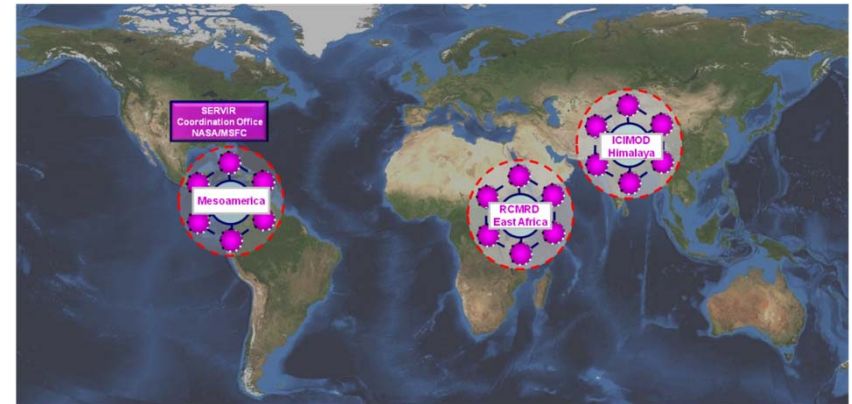
NASA: Supply access to high-quality, user-tailored tools and information services

SERVIR: Expand hub network and get them functioning

SERVIR Background



- Program History
 - Begun as a collaborative effort among NASA, USAID, World Bank, and Central American Commission for Environment and Development (CCAD)
 - Opened first hub in Panama in 2005 to serve Central America and the Dominican Republic in cooperation with CATHALAC
 - Inaugurated East Africa hub in 2008 (Nairobi, Kenya) with RCMRD
 - Inaugurated Hindu Kush-Himalaya hub in 2010 (Kathmandu, Nepal) with ICIMOD



SERVIR-Mesoamerica



Dedicated on February 3, 2005



Primary Issues

- Agriculture
- Biodiversity
- Climate
- Disasters
- Ecosystems
- Health
- Infrastructure

SERVIR-East Africa

Nairobi, Kenya



Dedicated on November 21, 2008



Primary Issues

- Biodiversity
- Climate
- Disasters
- Ecosystems
- Health
- Water
- Weather



SERVIR-Himalaya

Kathmandu, Nepal



Dedicated on October 5, 2010



ICIMOD

Primary Issues

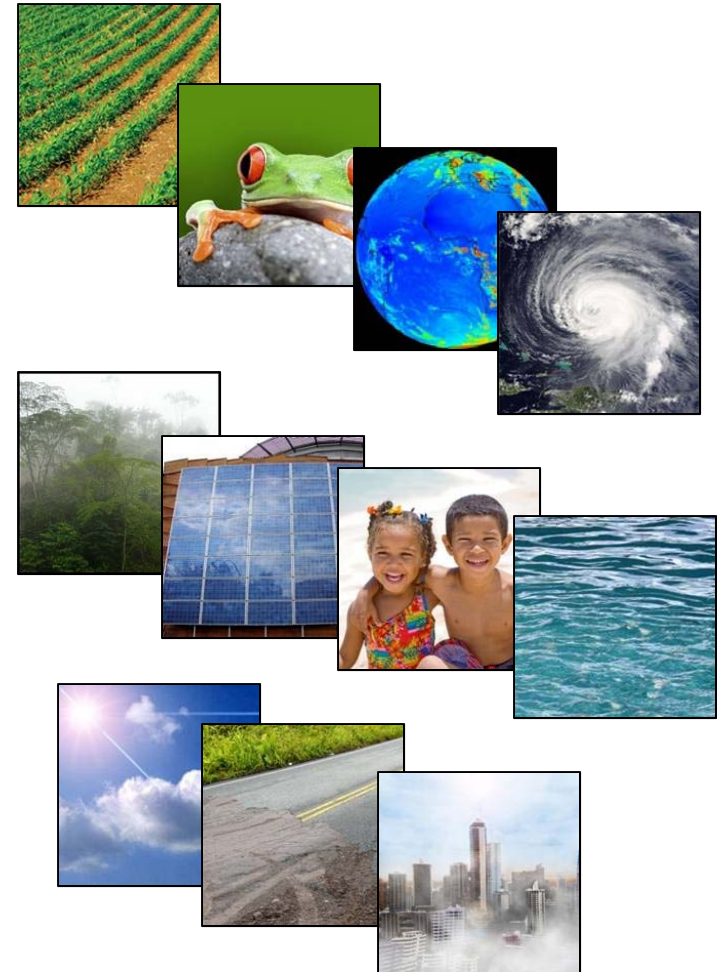
- Cryosphere
- Earthquakes and landslides
- Pollution
- Climate change



SERVIR in Action: GEOSS* Themes



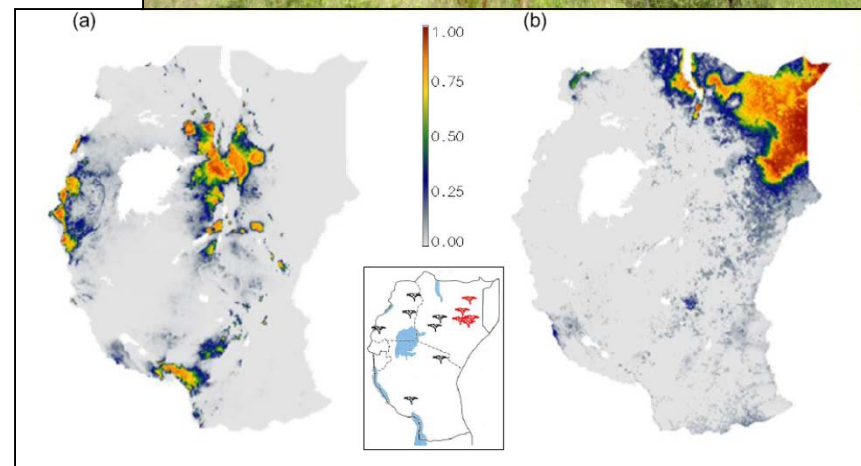
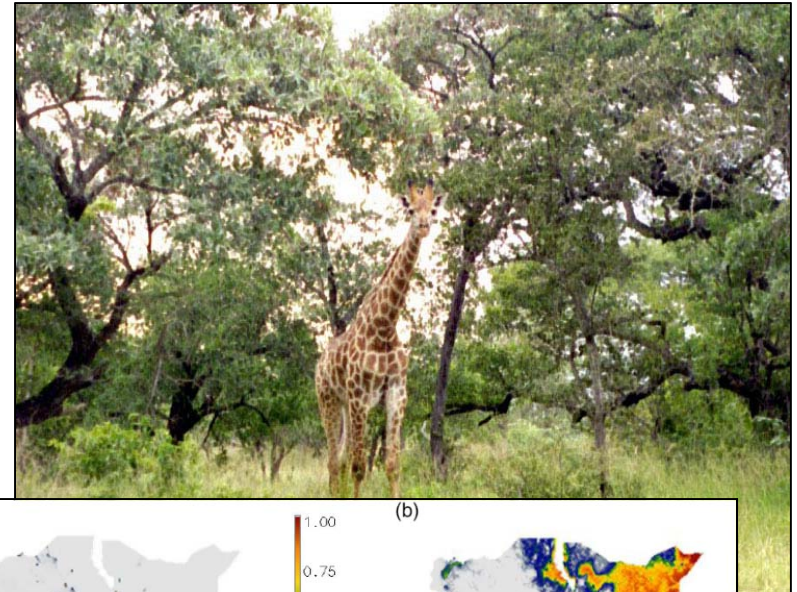
- Agriculture
- Biodiversity
- Climate
- Disasters
- Ecosystems
- Energy
- Health
- Water
- Weather



SERVIR in Action: Biodiversity



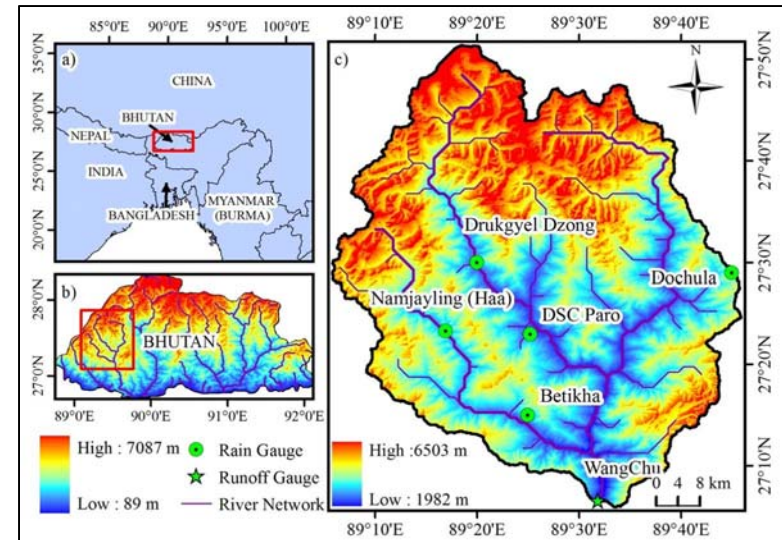
- USAID/SERVIR-East Africa Biodiversity project depicts ranges of key flora and fauna
- Application will expand the knowledge of biodiversity vulnerability to climate change
- Project incorporates data from multiple NASA sources, including Tropical Rainforest Measurement Mission ([TRMM](#)) and Shuttle Radar Topography Mission ([SRTM](#))
- Provide better understanding of how climate change will affect future vegetation and animal ranges



SERVIR in Action: Climate



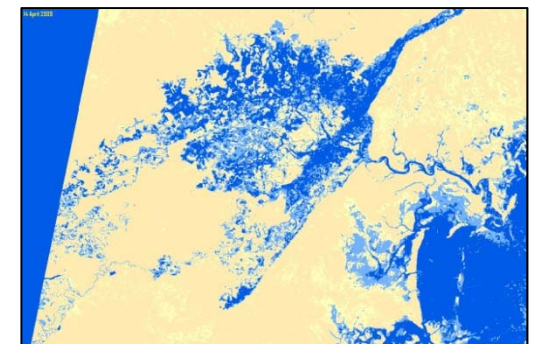
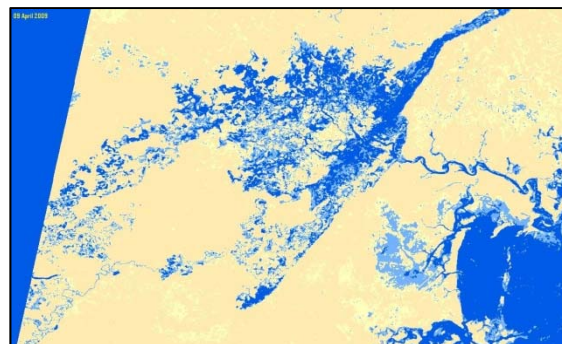
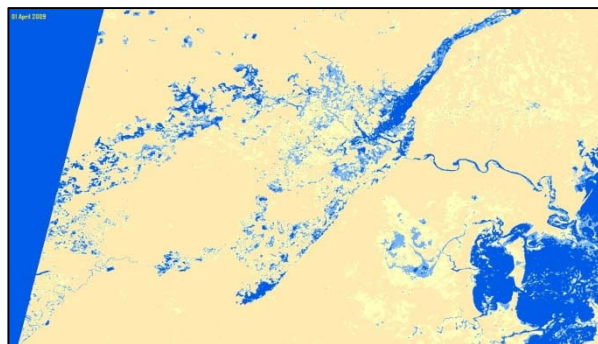
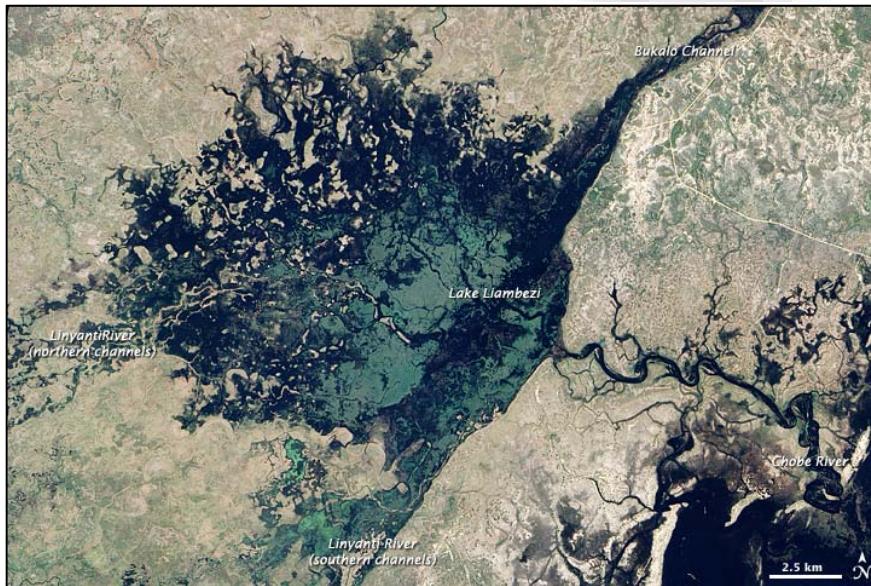
- Helping Bhutan to identify impacts of climate change on precipitation in Wangchu Valley
- SERVIR works with our Mesoamerica partners to identify effects of climate change on regional biodiversity



SERVIR in Action: Disasters



Flood Monitoring

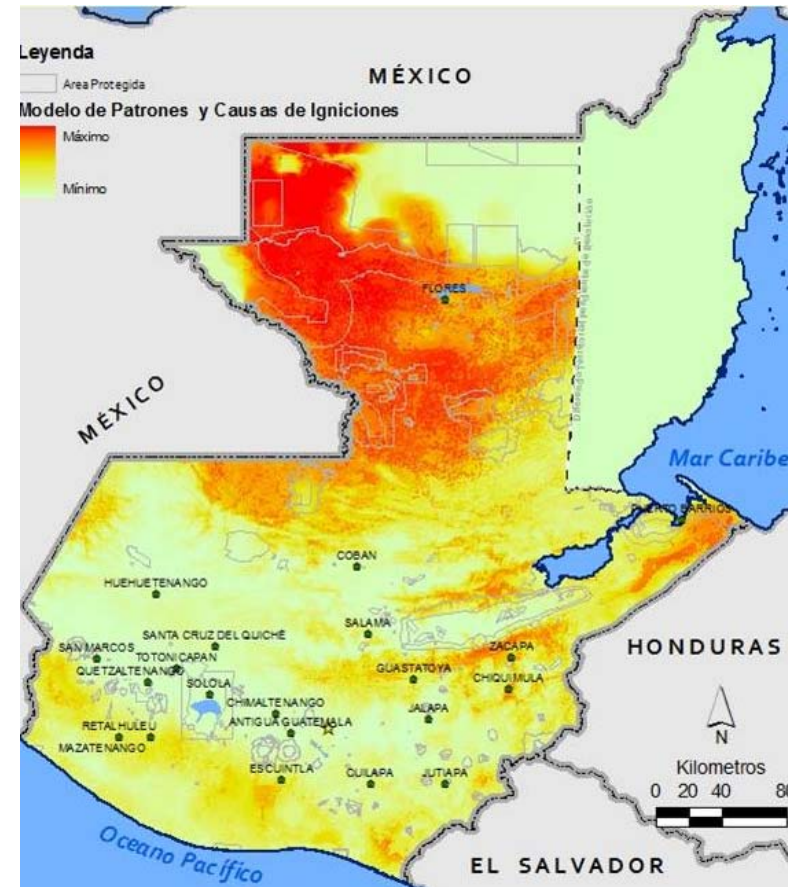
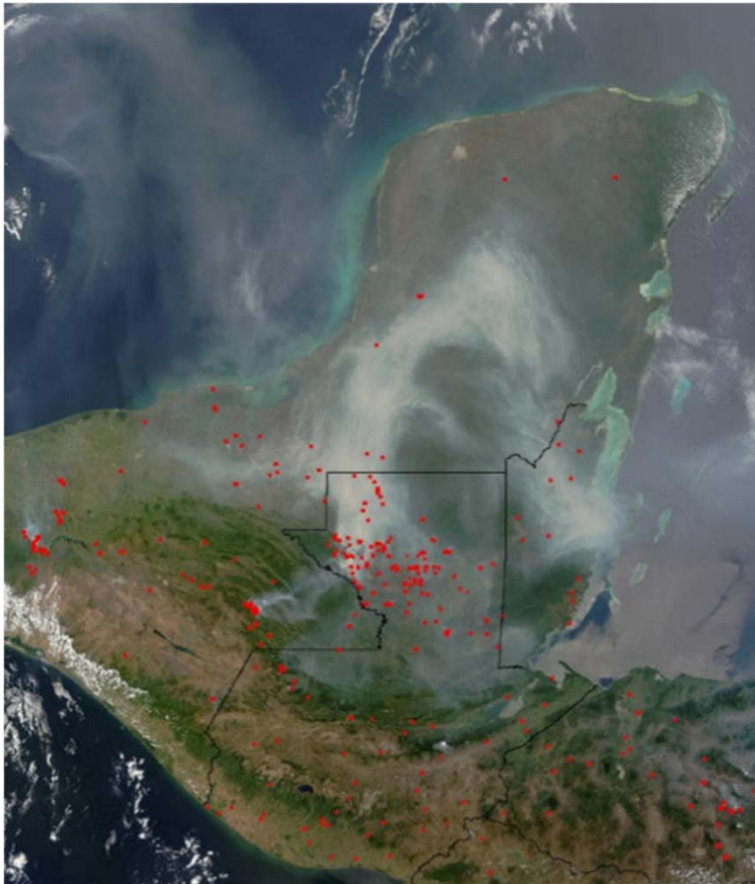


LAKE LIAMBEZI AREA – NASA EO1 BAND 6 SCENES FOR 01, 09 and 14 APRIL 2009
(false colours based on preliminary classification without ground verification)

SERVIR in Action: Disasters



Fire Detection and Tracking





SERVIR in Action: Disasters



- Develop a Community of Interest
- Develop Disaster Services Framework
- Enhance Web Services for Current State

Phase I

- Produce Catalog of SERVIR Disaster Services
- Produce shareable SOPs for use by and between hubs
- Develop standards for content and appearance of deliverables

Phase II

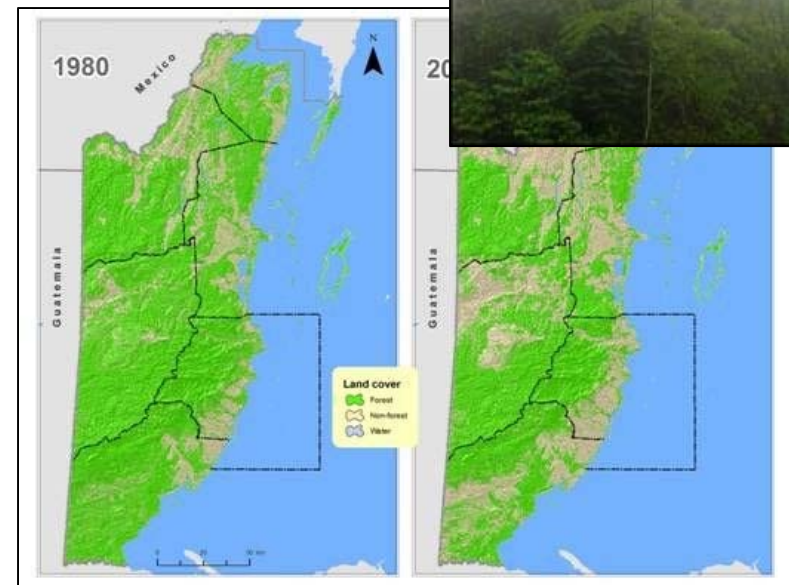
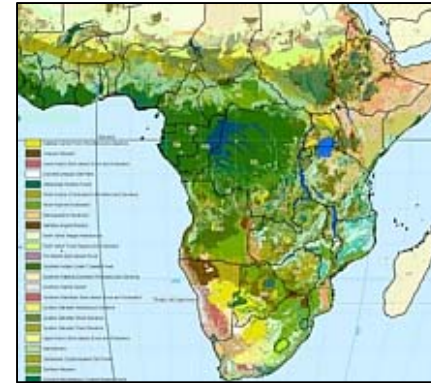
- Develop SERVIR Resiliency Plan
- Conduct Outreach and Collaboration
- Establish Mechanisms for Continued Learning

Phase III

SERVIR in Action: Ecosystems



- SERVIR-East Africa hosted USGS workshops to develop ecosystem maps of entire continent
- SERVIR-Mesoamerica performed a 30-year study of deforestation in Belize
 - Now national data and used for ongoing studies

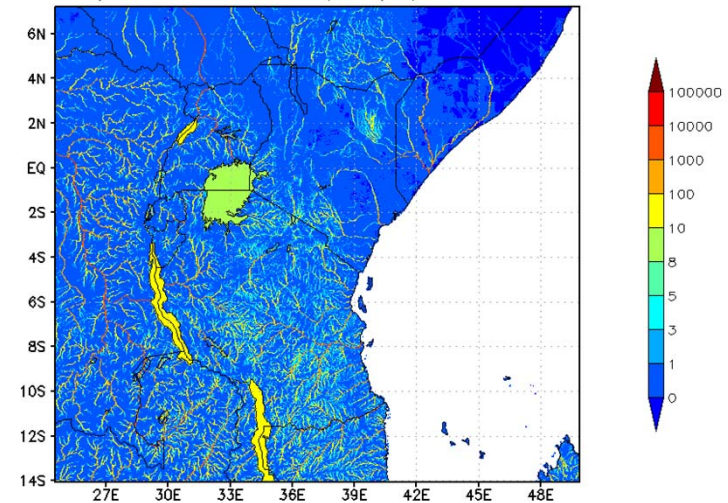


SERVIR in Action: Water



- Water managers in East Africa concerned about the availability of water in the region in multiple time ranges:
 - Historical (1940-present)
 - Current
 - Near term (next 72 hours)
 - Long term
- SERVIR uses Coupled Routing and Excess Storage (CREST) model, NASA satellite data, and local information to provide:
 - Streamflow
 - Evapotranspiration
 - Soil moisture
 - Flood conditions

Latest 24h/3h Stream Flow (m^3/s) 2012-04-04 09h



SERVIR in Action: Water



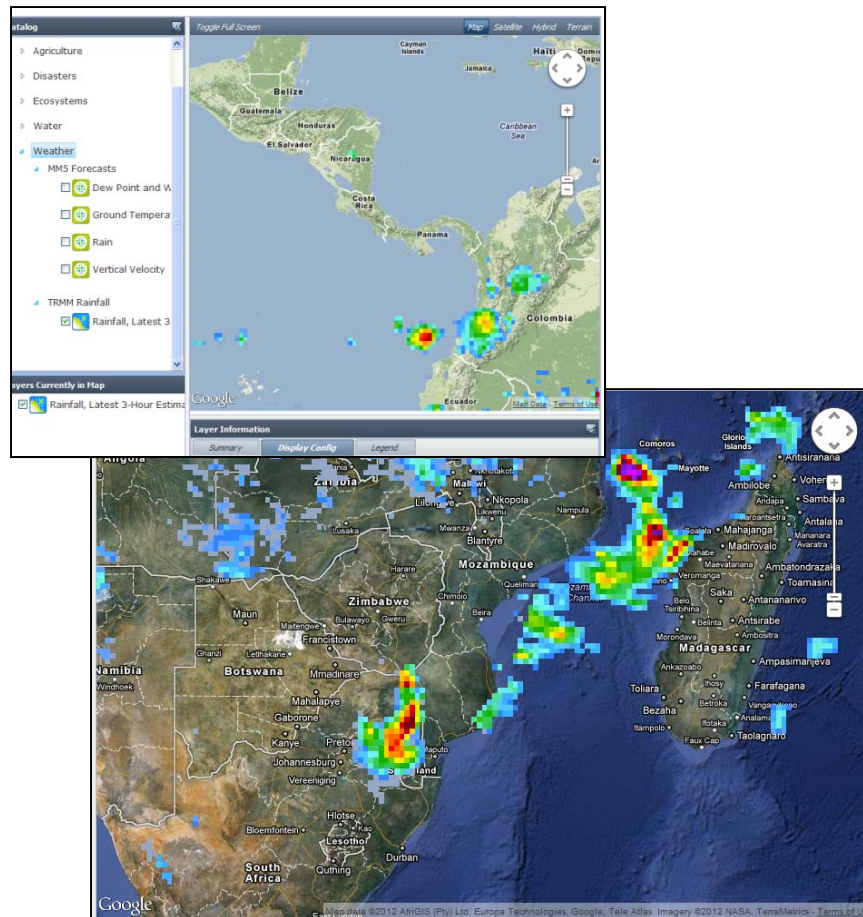
- SERVIR helped track the growth of a harmful algal bloom in Guatemala's Lake Atitlán
- The bloom grew, in part, due to pollutants in the water
- The images were featured on the front page of *Prensa Libre*, Guatemala's largest newspaper
- The algal bloom resulted in local changes to water treatment practices



SERVIR in Action: Weather



- SERVIR partners with NOAA and the U.S. National Weather Service to provide satellite data and computer-based weather forecasting models for Central America
 - Precipitation
 - Severe weather
 - Air quality



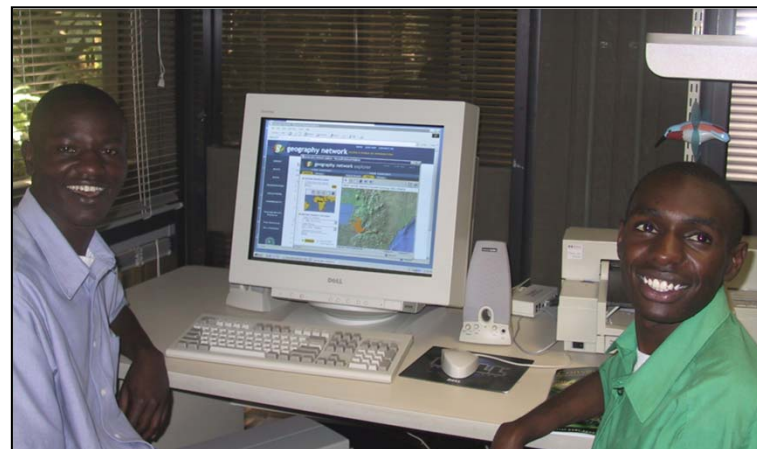
Capacity Building



My Country, Our Earth (MyCOE)



- Building capacity to protect biodiversity using GIS, RS, and geospatial analytical techniques
- Strengthening collaboration amongst universities, government environmental authorities, and NGOs
- Students and mentors competitively selected; both receive modest stipends to conduct six-month-long projects and travel support
- Soon to be expanded to other SERVIR regions



SERVIRGlobal.net



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Resource Inventory and Assessment of Phobjikha Wetland Ecosystem
The application provides important information and a basis for management zoning of the valley for conservation efforts. It has been

[Read More](#)



Scenario-based Climate Change Impact on Water Availability and Hydrologic Flows in the Wangchu Basin of Bhutan
Water security is a major concern related to climate change. This SERVIR application uses a distributed hydrological model called CREST

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SERVIR-East Africa Visit by US Asst. Sec. of State Dr. Kerri-Ann Jones
On Feb 20, 2012, Dr. Kerri-Ann Jones, Assistant Secretary of State, visited the SERVIR-East Africa hub at RCMRD.

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SERVIR to conduct remote sensing training at Mexico's University of Veracruz in support of public health project
SERVIR research associates Africa Flores and Eric Anderson will be training public health officials as well as university students and

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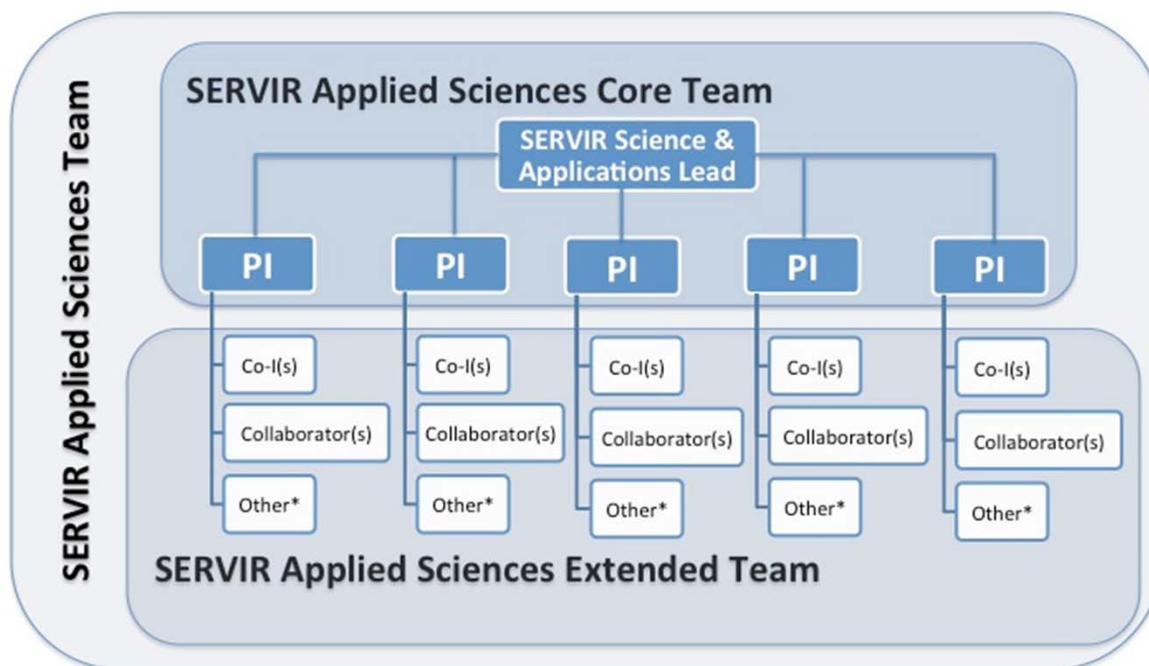
DISASTER SUPPORT ACTIVITIES



SERVIR Applied Science Team



This solicitation seeks proposals for individual members of a new Applied Sciences Team to support the SERVIR program in developing science applications for international development through the use of Earth observations.



Partnerships



- US Government Agencies
 - NASA
 - National Oceanographic and Atmospheric Administration (NOAA)
 - U.S. National Weather Service
 - U.S. Agency for International Development
 - U.S. Environmental Protection Agency
 - U.S. Forestry Service
 - U.S. Geological Survey
- Other Partners
 - Group on Earth Observations (GEO)
 - Kenya Meteorological Department (KMD)
 - United Nations Platform for Space-Based Information for Disaster Management and Emergency Response (UN-SPIDER)
 - World Bank

ISERV



ISERV *Pathfinder* in WOLF

@ 350 km alt.	Angular	Spatial
Resolution	1.65 arc sec	2.8m
FOV	2.38° x 1.59°	14.5km x 9.8km
Spectral	350nm to 800nm	

Applications

- Primary** – Humanitarian Response/Disaster Analysis (assessment, ground operations support)
- Secondary** – Deforestation Survey, Space Archaeology, Agriculture Inventory

Current Status

- Fit check and HFIT verification – 11Jan2012
- Payload delivery to CMC @ JSC – 12Jan2012
- Shipment to JAXA – 23Jan2012
- Launch aboard HTV-3 – 26Jun2012
- System operations initiation – 1Nov2012

ISERV *Pathfinder* is a COTS-based, visible spectrum instrument designed to provide a low cost path to experience and expertise in data acquisition, and system design and implementation. *Pathfinder* is the first step in an envisioned suite of Earth observing instruments aboard ISS, culminating in a broad spectrum, multipurpose, externally mounted sensor system.

Future Work



- SERVIR plans to increase its number of hubs
- SERVIR issued a Research Opportunities in Space and Earth Sciences (ROSES) call to encourage work on other GEOSS themes we currently do not address:
 - Agriculture
 - Energy
 - Infrastructure
- Greenhouse Gas (GHG) inventory application in development
- ISERV

